Active Management of OsteoArthritis

Arthritis is a major cause of disability and chronic pain in Australia.

>3.95 Million Australians suffer from arthritis

Up to two thirds of people suffering from osteo-arthritis are of working age.

Osteo-arthritis is a progressive condition.

Traditional treatments are only directed toward pain relief/analgesia.

We believe in the active management of arthritis.

Whilst pain relief remains a primary objective, we use a multidisciplinary approach that aims to actively prevent/reduce progression of arthritis.

Treatment Plan/Options

Primary Medical Therapy

- Analgesia - Simple Analgesics and/or non-steroidal anti-inflammatories
- Supplements - Glucosamine Sulphate
- Exercise - Exercise Physiology/Physiotherapy
- Biomechanical Assessment - Podiatry
- Weight Loss - Nutritionist/Dietician

Advanced Medical Therapy

- PhotoActivated Platelet Rich Plasma Injection
- Stem Cell Therapy
- Viscosupplement Injections

What is Involved ?

Prior to any treatment you will receive a thorough `arthritis health care' consultation with one of our sports medicine physicians. Current pain management therapies will be optomised.

If relevant, further nutritional and exercise consultations will be arranged.

Your suitability for for other `advanced medical therapy' options will be assessed.

Formal imaging (XRays or MRI) will be arranged if required.

Your response to treatment will be regularly followed up to maximise potential improvement.

Primary Medical Therapy

Analgesia

- Paracetamol
- Non Steroidal Anti-inflammatories

  **It is important to consult with your doctor prior to using anti-inflammatories in the treatment of your arthritis.*

Supplements

- Glucosamine
  - Glucosamine is an amino-acid that forms the common `back bone' of cartilage matrix.
  - Evidence suggests that glucosamine supplements may offer both pain relief and reduce the progression of arthritis
  - Dose
    - At least 1000mg/day of Glucosamine Sulphate (NOT Glucosamine Hydrochloride)
  - Chondroitin ? Shark Fin ??
    - Many glucosamine preparation have additional additives. Some evidence suggests additional benefits with Glucosamine + Chondroitin Sulphate preparations.
  - Risks
    - Allergy/anaphylaxis - Glucosamine is derived from shell fish.
  - Research :
    - McAlindon, et al. Glucosamine and Chondroitin for Treatment of Osteoarthritis - Review Article, JAMA 2000, 283(11):1469-1475
    - Clegg, et al. Glucosamine, Chondroitin Sulphate, and the Two in Combination for Painful Knee Osteoarthritis, N Engl J Med 2006, 354:795-808

Exercise

- Regular and appropriate exercise can be effective in reducing pain and disability associated with arthritis
- A structured program created and supervised by a professional rehabilitation Exercise Physiologist or Physiotherapist is recommended.
- Exercise Principles (FITT)

  Frequency : At least 3 session per week for > 8weeks

  Intensity : Moderate Intensity

  Type of exercise : Aerobic, resistance and load bearing

  Time : At least 30minute sessions
- Research :

  Petrella, et al. Is exercise effective treatment for osteoarthritis of the knee?, BJSM 2000, 34:326-331

Biomechanical Assessment

- Podiatry assessment and relevant biomechanical adjustment can often help to unload areas of arthritis and therefore reduce pain and improve function.

Weight Loss

- Increased weight is a risk factor for the development of osteoarthritis in weight bearing ie. (hip and knee) and also non weight bearing joints (ie. hand).
- Loss of 5kg has been shown to be effective in reducing the risk of knee arthritis by a factor of up to 50%.
- It is important to have a structured weight loss program developed by a qualified Nutritionalist or Dietician.
- Research :

  Felson, et al. Risk factors for incident radiographic knee osteoarthritis in the elderly: the Framingham Study. Arthritis Rheum 1997, 40:728-733

Advanced Medical Therapy : PhotoActivated Platelet-rich Plasma

Platelet-rich Plasma (PRP) is a growth factor rich medium that is developed from your own blood. It is not synthetic.

Studies have shown significant reduction in osteoarthritic knee pain within 5weeks post injection and continued improvement in symptoms for up to 1-2 years.

Platelet-rich Plasma derived growth factors have been shown to stimulate cartilage matrix synthesis.

Recent developments of PhotoActivation have been successful in increasing the naturally derived anti-inflammatory mediators within PRP.

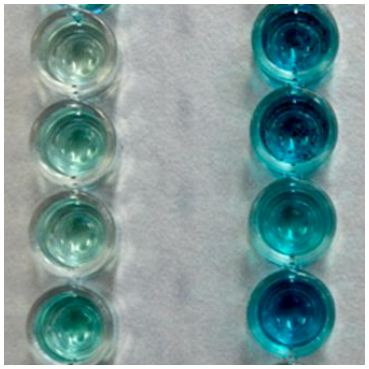


Figure 1. Increased anti-inflammatory mediator post PhotoActivation.
(Reproduced with the approval of Adistem Pty Ltd)

Why use PhotoActivated Platelet-rich Plasma ?

PRP therapy is indicated in mild to moderate osteoarthritis where pain is not controlled by other conservative measures such as simple analgesics.

PRP has been shown to improve pain control and theoretically may slow the progression of arthritis.

PRP therapy is an `autologous' medium - it is developed from your own blood and does not contain any animal products and is not synthetic.

What is Involved ?

PRP therapy involves three injections into the injured area over two weeks.

Patients are required to ***cease taking anti-inflammatory tablets*** one week prior to the PRP procedure.

Patients taking regular aspirin should continue to take this as prescribed by their general practitioner.

Injections are done under sterile conditions, with local anaesthetic and using ultrasound guidance.

On each occasion you will be required to donate blood for generation of the PRP.

Each procedure will take approximately 45 minutes.

It is recommended that you have someone to drive you home after an injection due to some potential residual effects of the local anaesthetic or discomfort from the procedure.

All patients who undergo PRP therapy will have follow-up with their treating physician.

Patients will be required to fill out questionnaires to allow appropriate analysis of their treatment response.

Risks

Bleeding/Bruising

Infection

- To reduce chance of infection all injections are done under sterile conditions using ultrasound guidance for accuracy.
- PRP has natural anti-bacterial properties that reduce chance of infection.

Pain/Discomfort

- Injections can be uncomfortable. Where possible a regional nerve block is performed to improve comfort.
- Some people may experience a vasovagal episode during or post injection where they feel lightheaded and sweaty. This is self limiting.

Contra-Indications

Whilst very safe, use of platelet-rich plasma is contra-indicated in the following conditions -

- pregnancy
- cancer
- some bleeding disorders

Cost

The cost of PhotoActivated Platelet-rich Plasma is ~ $300. A significant portion of this is covered by medicare. Patients receive a greater rebate (and thus reduced out of pocket) if referred by their regular doctor or another physician. Pensioners have a reduced out of pocket expense.

Evidence

Research has shown PRP to be effective in the treatment of mild to moderate osteoarthritis.

Research Articles

- Spakova, et al. Treatment of Knee Joint Osteoarthritis with Autologous Platelet-Rich Plasma in Comparison with Hyaluronic Acid. Am J Phys Med & Rehab 2012;91(5):411-417
- Kon et al. Platelet-rich plasma: intra-articular knee injections produced favorable results on degenerative cartilage lesion, Knee Surg Sport Traumatol Arthrosc, 2009, Online Publication
- Baltzer, et al. Autologous conditioned serum is an effective treatment for knee osteoarthritis, Osteo and Cartilage 2009, 17:152-160
- Sanchez, et al. Intra-articular injection of autologous preparation rich in growth factors for the treatment of knee OA: a retrospective cohort study, Clin Exp Rheumatol. 2008, 26(5):910-913
- Drengk, et al. Influence of platelet-rich plasma on chondrogenic differentiation and proliferation of chondrocytes and mesenchymal stem cells. Cells Tissues Organs 2009; 189(5):317-26.
- Saito, et al. Intraarticular administration of platelet-rich plasma with biodegradable gelatin hydrogel microspheres prevents osteoarthritis progression in the rabbit knee, Clin Exp Rheumatol 2009, 27(2): 201-207.

Post Injection Instructions

Pain Flare

To improve the comfort of the procedure local anaesthetic can be infiltrated at site of the injection. Where possible a regional nerve block is performed.

Some patients may experience a small `flare' of their pain after the local anaesthetic wears off. This can last between 12 - 72 hours.

It is advised that on return to home that you take 2 paracetamol (panadol) tablets. You will be supplied with a script from your treating doctor for stronger analgesia/pain relief if required.

Return to Activity/Work

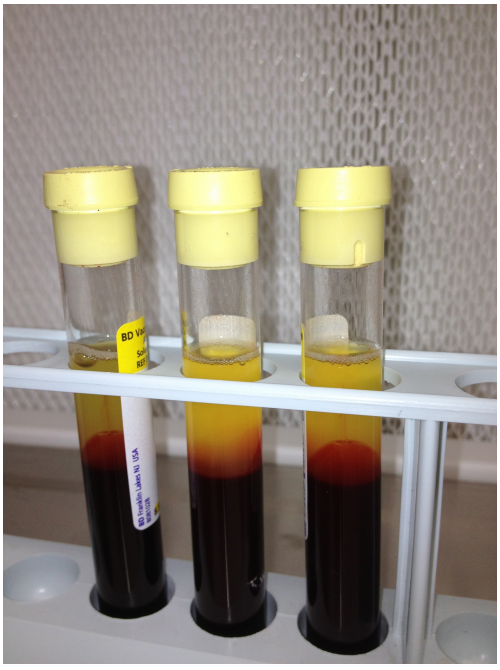
Patients in low impact work roles are expected to need up to 3 days off work due to potential discomfort. Higher impact jobs that require heavy lifting may need longer. It is advised that patients should not return to their regular work/activities until their pain has returned to their pre-injection level of comfort.

Exercise post Injection

It is advised that patients should re-commence their exercise/strengthening rehabilitation program (physiotherapy guided) when their pain returns to pre-injection baseline levels.

Physiotherapy/Massage

It may be useful to have range of motion therapy and also soft tissue massage in the immediate week after your injection.



Advanced Medical Therapy - Adipose-derived Stem Cell Therapy

Cell based therapies (including Stem Cells and Platelet-rich Plasma) offer exciting potential in treating conditions such as osteoarthritis

Adipose tissue is a rich source of adipose-derived stem cells. These cells have an ability to differentiate into cartilage cells.

Adipose-derived stem cells may improve symptomatic arthritis by :

- reducing inflammation
- assisting the healing mechanism
- replacing/regenerating damaged cartilage

Are stem cells safe ?

The use of adipose-derived stem cells for the treatment of arthritis and other conditions is in a preliminary stage.

Current research indicates that it is a safe procedure.

- Clinical trials involving adipose-derived stem cells with follow up of up to two years have not demonstrated any adverse effects (Garcia-Olmo, et al. 2005).
- Bone marrow stem cells used for treatment of arthritis have not shown adverse outcome in over 10years of follow-up (Wakitani, et al. 2010).

Adipose-derived stem cells are an autologous medium and taken from your own body.

What is the evidence ?

Laboratory based trials have confirmed the ability of adipose-derived stem cells to differentiate into cartilage (Diekman, et al. 2010).

Adipose-derived stem cells have shown cartilage regrowth and functional improvement in animal studies (Dragoo, et al. 2007).

Bone marrow derived stem cell trials have shown pain and function improvement with follow-up imaging indicating improvement in cartilage volume (Wakitani, et al. 2007).

Blood derived stem cell therapy when combined with orthopaedic arthroscopy has shown biopsy confirmed regeneration of cartilage like tissue (Saw, et al. 2011).

What is Involved ?

Adipose-derived stem cell therapy involves a harvest procedure performed under local anaesthetic and light sedation.

Adipose tissue is taken from the body (usually the abdomen) using a procedure similar to liposuction.

Harvested adipose tissue undergoes further processing to extract the adipose-derived stem cell component.

Patients will receive up to four injections of adipose-derived stem cells into their arthritic joint.

Conditions may require orthopaedic intervention prior to stem cell therapy.

All patients who undergo adipose-derived stem cell therapy will have formal follow-up with their treating physician.

Contra-Indications

Whilst current research indicates that adipose-derived stem cell injections are a safe therapy, it is contra-indicated in the following conditions :

- pregnancy
- cancer
- some bleeding disorders

Cost

Currently there is no Medicare or Private Health Fund rebate for this procedure.

Research

- Diekman B, et al. Chondrogenesis of Adult Stem Cells from Adipose Tissue and Bone Marrow: Induction by Growth Factors and Cartilage Matrix. Tissue Eng. 2010; 16(2):523-533
- Dragoo J, et al. Healing full-thickness cartilage defects using adipose-derived stem cells. Tissue Eng. 2007; 13(7):1615-1621.
- Garcia-Olmo D, et al. A phase 1 clinical trial of the treatment of Crohn's fistula be adipose mesenchymal stem cell transplantation. Dis Colon Rectum. 2005; 48(7):1416-1423
- Saw KY, et al. Articular cartilage regeneration with autologous peripheral blood progenitor cells and hyaluronic acid after arthroscopic subchondral drilling: A report of 5 cases with histology. J Arthroscopic and Rel Surg. 2011; 27(4):493-506.
- Wakitani S, et al. Repair of articular cartilage defects in the patello-femoral joint with autologous bone marrow mesenchymal cell transplantation: three case reports involving nine defects of five knees. J Tissue Eng Regen Med. 2007; 1(1):74-79.
- Wakitani S, et al. Safety of autologous bone marrrow-derived mesenchymal stem cell transplantation for cartilage repair in 41 patients with 45 joints followed for up to 11 years and 5 months. J Tissue Eng Regen Med. 2011; 5(2):146-150.

Advanced Medical Therapy - ViscoSupplement Injections

Viscosupplements are a form of hyaluronic acid.

Viscosupplements are designed to lubricate and 'cushion' the arthritic joint.

Viscosupplement injections have been shown to reduced arthritis related pain within 12 weeks.

Reduction in pain can last for up to 6 months

Recent research indicates that repeat use of viscosupplement injections may slow the progression of arthritis.

What is Involved ?

Viscosupplement therapy involves 1-5 injections into the arthritic joint.

Injections are done under strict sterile surgical conditions, with local anaesthetic and using ultrasound guidance.

It is recommended that you have someone to drive you home after an injection due to some potential residual effects of the local anaesthetic or discomfort from the procedure.

Risks/Complications

Bleeding/Bruising

Infection

- To reduce chance of infection all injections are done under strict sterile conditions using ultrasound guidance for accuracy.

Pain/Discomfort post procedure

- A proportion of patients experience mild discomfort post injection
- Regular simple analgesics such as paracetamol are recommended

Post injection `flare up'

- Up to 10% of patients may experience a post injection inflammatory `flare'.
- This may require aspiration of the joint and injection of cortisone to reduce the inflammatory response.

Contra-Indications

Use of visco-supplement is contra-indicated in the following conditions :

- pregnancy
- previous `flare up'
- allergies to bird products - ie. feathers, eggs, poultry.

Cost

Cost of the Viscosupplement is ~$500. This cost may be partially covered by your health fund. It is advised that you contact your health fund to enquire about funding.

Research

- Adams, et al. The role of viscosupplementation with hylan G-F 20 (Synvisc®) in the treatment of osteoarthritis of the knee: a Canadian multicenter trial comparing hylan G-F 20 alone, hylan G-F 20 with non-steroidal anti-inflammatory drugs (NSAIDs) and NSAIDs alone, OA and Cartilage 1995, Vol 3, 4:213-225.